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中国及邻近地区鳞果星蕨属的分类研究*

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Taxonomic studies of the fern genus *Lepidomicrosorum* Ching et Shing (Polypodiaceae) from China and neighboring regions

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Abstract The genus *Lepidomicrosorum* was separated from *Microsorum* Link by Ching and Shing in 1983. It is characterized by minute scattered sori covered with peltate and subsessile paraphyses when young. Tagawa detected that *Polypodium subhastatum* Baker, the type of this new genus, has this kind of paraphyses and thus transferred this species to *Neocheiropteris* Christ in 1952, a genus with divided lamina. During our study of the Microsoroideae, a revision of *Lepidomicrosorum* from China and neighboring regions is made on the basis of field and herbarium observation and evidence from anatomy, spore morphology, ecology, and distribution. *Lepidomicrosorum* is recognized as an independent genus and the demarcation line of its species is reconfirmed. Species with peltate scale-like paraphyses in *Microsorum* were transferred to *Lepidomicrosorum*. As a result, two species are recognized in this species, i.e. *L. buergerianum* (Miq.) Ching et Shing and *L. hymenodes* (Kunze) L. Shi et X. C. Zhang.

Key words *Lepidomicrosorum*; Taxonomy; China and neighboring regions

摘要 鳞果星蕨属是从星蕨属中划分出来的,其孢子囊群上幼时覆盖着近无柄的鳞片状隔丝。本文在研究星蕨亚科植物标本和野外考察的基础上,结合解剖学、孢粉学、生态学和植物地理学资料,对鳞果星蕨属植物作了修订。承认该属的独立性,并研究了有关种类的变异幅度,将星蕨属中有盾状隔丝的种类归入本属,承认鳞果星蕨和云南鳞果星蕨两个种。

关键词 鳞果星蕨属;分类;中国及邻近地区

鳞果星蕨属 *Lepidomicrosorum* Ching et Shing 是秦仁昌和邢公侠于 1983 年从星蕨属 *Microsorum* Link 分出的。1952 年,Tagawa 首次发现 *Polypodium subhastatum* Baker 的孢子囊群幼时被盾状隔丝,将其归入了扇蕨属 *Neocheiropteris*。1979 年,朱维明发表了有盾状隔丝的另一个种小果盾蕨 *Neolepisorus microsorioides* W. M. Zhu。秦仁昌和邢公侠认为这些处理都不恰当,他们通过对这一类群的形态比较研究,认为鳞果星蕨属不同于星蕨属之处在于叶片沿主脉下面有狭披针形的粗筛孔状的小鳞片,孢子囊群具隔丝;与盾蕨属不同之处在于附生,攀援,叶片为狭披针形或线状披针形,侧脉不明显,稍曲折,孢子囊群小而星散,具几无柄的盾状隔丝;与扇蕨属无近缘关系;本属与毛鳞蕨属

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Tricholepidium Ching 最近，但根状茎上的鳞片腹部中央不具一簇深棕色粗毛，鳞片为披针形，孢子囊群的隔丝几无柄。因此，秦仁昌和邢公侠将主产于长江中游地区的这一群植物归入了鳞果星蕨属，并认为鳞果星蕨属可能是新近起源的，由星蕨属分化而出，特别是与攀援星蕨 *Microsorum buergerianum* 及其近缘种相近，区别只在于本属具盾状隔丝。其后，吴兆洪和秦仁昌(1991)又把该属归入瓦韦亚科 Lepisorioideae。1991 年，Bosman 把它们归入薄唇蕨属 *Leptochilus*，承认两个种：*L. buergerianus* (Miq.) Bosman 和 *L. subhemionitideus* (Christ) Bosman。Nooteboom (1997)将这一类群归并为星蕨属的一个种 *M. superficiale* (Bedd.) Ching，包括了有盾状隔丝和无盾状隔丝的两个类型。

本文在研究广义的星蕨属植物标本和野外考察的基础上，结合解剖学、孢粉学、生态学和植物地理学资料，对鳞果星蕨属植物作了修订。承认属的概念，将星蕨属中有盾状隔丝的种类归入本属，并重新划定了种的界限，将鳞果星蕨属下的 23 个种和其它的一些名称归并为两个种。

1 主要分类性状分析

1.1 孢子囊群隔丝

本属植物与星蕨属中的近缘种如 *M. superficiale* (Bl.) Ching 的主要区别在于具有盾状隔丝；与同样具盾状隔丝的盾蕨属的区别在于本属植物为附生，隔丝具短柄；与也具有盾状隔丝的毛鳞蕨属的区别则在于本属植物根状茎上的鳞片不具一簇深棕色粗毛。

1.2 叶片形态

本类群形态变化很大，如峨眉山从海拔 900～1900 m 的范围内，就有 8 种 1 变种 (Ching & Shing, 1983)。特别是 *M. buergerianum* (Miq.) Ching，从树干的基部向上攀援生长，叶形逐渐变狭窄。本属可分为两种类型：一种为叶短于 10 cm，披针形或三角形，基部宽或呈心形；另一种叶长过 20 cm，长披针形，基部渐狭或呈楔形。

1.3 叶质

根据叶质和叶片侧脉清晰度分为两种类型：一种为厚纸质，侧脉不明显；另一种草质，侧脉明显。

1.4 根状茎横切面

根状茎的横切面可分为两种类型：一种只具环形维管束；另一种具环形维管束或也具少量星散的厚壁组织(图 1)。

1.5 孢子形状

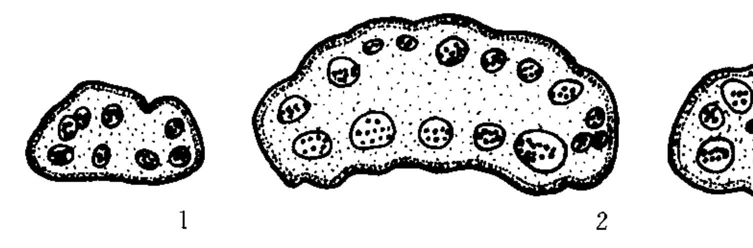
扫描电镜观察到鳞果星蕨属植物的孢子为圆肾形，外壁纹饰瘤块状(图 2)。

2 生态特性

本属植物均为攀援植物，孢子体的初期发育于林下土壤中，而后长出细长的根状茎，爬向树干基部并向上攀援，高可达 2～3 m，有时也附生于林荫石壁上，根状茎紧贴于树干或石壁上，上面密生鳞片，叶远生，下部叶均较宽，逐渐向上，叶呈狭披针形。喜生于海拔 600～2000 m 空气潮湿而流动性不大的阴凉的山地次生林中。

3 植物地理分布

在地理分布上，本属主要分布于中国西南部和中部的山地次生林(表 1，图 3 和图 4)。



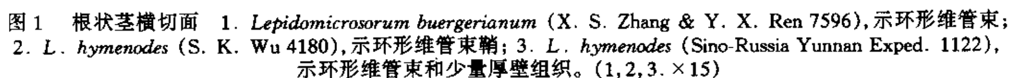


图 1　根状茎横切面　1. *Lepidomicrosorum buergerianum* (X. S. Zhang & Y. X. Ren 7596)，示环形维管束；2. *L. hymenodes* (S. K. Wu 4180)，示环形维管束鞘；3. *L. hymenodes* (Sino-Russia Yunnan Exped. 1122)，示环形维管束和少量厚壁组织。(1, 2, 3. ×15)

Fig. 1　The cross section of the rhizome of *Lepidomicrosorum*. 1. *L. buergerianum* (X. S. Zhang & Y. X. Ren 7596), with circumvascular sheaths in the cortex only; 2. *L. hymenodes* (S. K. Wu 4180), with circumvascular sheaths in the cortex only; 3. *L. hymenodes* (Sino-Russia Yunnan Exped. 1122), with circumvascular sheaths and scatted strand of sclerenchyma in the cortex. (1, 2, 3. ×15)

分布区从浙江、江西、台湾、湖北、湖南、广东、广西到四川、贵州、云南和西藏，特别是四川峨眉山，从海拔 900m 至 2000 m 均有本属植物的分布，且形态变异很大，是本属的发育中心。日本、越南、尼泊尔和印度也有分布。

表 1　鳞果星蕨属 2 个种的地理分布

Table 1　Distribution of two *Lepidomicrosorum* species

Species	China											Japan	Vietnam	Nepal	India
	1	2	3	4	5	6	7	8	9	10	11				
L. buergerianum	+	+	+	+	+			+	+	+		+	+		
L. hymenodes				+	+	+	+	+	+	+	+	+	+	+	+

1. Zhejiang; 2. Jiangxi; 3. Taiwan; 4 Hubei; 5. Hunan; 6. Guangdong; 7. Guangxi; 8. Sichuan; 9. Guizhou; 10. Yunnan; 11. Xizang.

4　系统发育

同意秦仁昌和邢公侠(1983)认为的本属晚近起源于星蕨属的观点，特别是与褐叶星蕨（*M. superficiale*）及其近缘种，唯一区别是本属植物的孢子囊群幼时被盾状隔丝。

5　鳞果星蕨属植物的分类

鳞果星蕨属

Lepidomicrosorum Ching et Shing, Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 1. 1983; S. H. Wu et Ching, Fam. Gen. Pterid. China 519. 1991; R. J. Johns, Ind. Fil. Suppl. 195. 1996; 52. 1997. TYPE: *Lepidomicrosorum buergerianum* (Miq.) Ching et Shing ex S. X. Xu (*Polypodium buergerianum* Miq. 1967) = *Lepidomicrosorum subhastatum* (Baker) Ching (*Polypodium subhastatum* Baker 1889).

中小型附生植物。根状茎长，攀援于树干或岩石上，顶部无叶，呈鞭状，密被鳞片，鳞片红棕色，披针形，长渐尖头，透明，具粗筛孔，边缘有疏齿。叶疏生，中肋下面有一、二狭披针形的粗筛孔小鳞片，有柄，叶片多变，披针形或戟形，基部楔形或心形，边缘全缘或有时波状或撕裂；叶纸质，网状，有内藏小脉。孢子囊群圆形，多星散分布于中肋两侧呈不规则排列，幼时有隔丝覆盖，隔丝盾状，几无柄，具透明粗筛孔，随孢子囊发育而早落。孢子

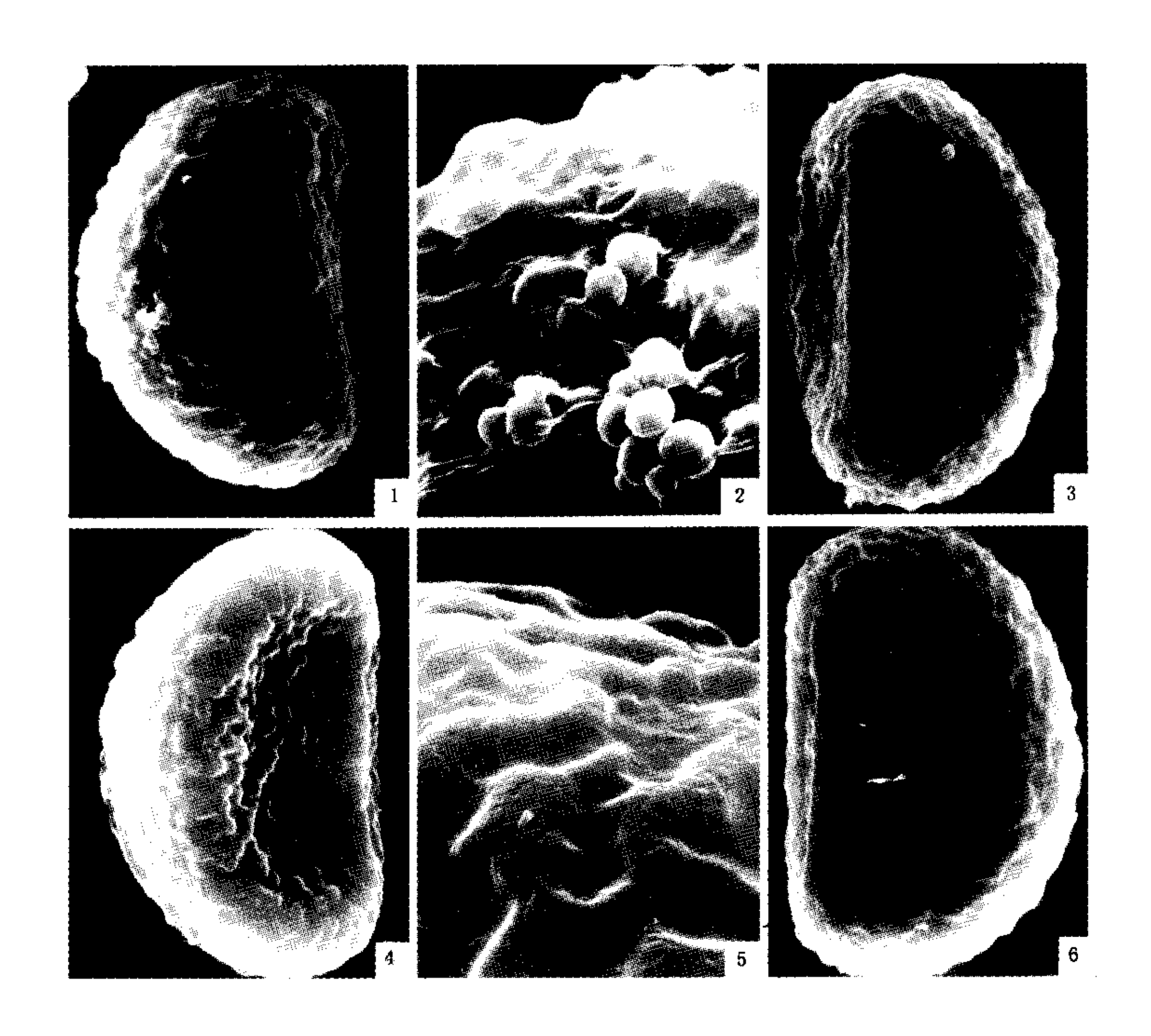


图2 鳞果星蕨属孢子扫描电镜照片 1,2,3. 鳞果星蕨; 4,5,6. 云南鳞果星蕨。
Fig.2 SEM photographs of spores 1,2,3. *Lepidomicrosorum buergerianum*; 4,5,6. *L. hymenodes*. (1,2,3. R. C. Ching 106; 4,5. Y. Tsiang 4324; 6. W. P. Fang 2493) (1,3. ×1020; 2. ×4800; 4,6. ×1020; 5. ×4800).

圆肾形,外壁纹饰瘤块状。

本属2种,主产于中国西南部和中部地区。日本、越南、尼泊尔和印度也有分布。

分种检索表

1. 叶长通常小于10 cm,披针形或三角形,基部宽或呈心形;叶厚纸质,侧脉不明显;根状茎细,只具环形维管束;孢子囊群圆形,小而密 …………………………………… 1. **鳞果星蕨 L. buergerianum**
1. 叶长通常大于20cm,长披针形,基部渐狭或呈楔形;叶草质,侧脉明显;根状茎粗,具环形维管束或也具少量星散的厚壁组织;孢子囊群圆形,较大 ………………… 2. **云南鳞果星蕨 L. hymenodes**

Key to the species

1. Frond normally under 10 cm long, deltoid or lanceolate with deeply cordate or dilated base; texture thick

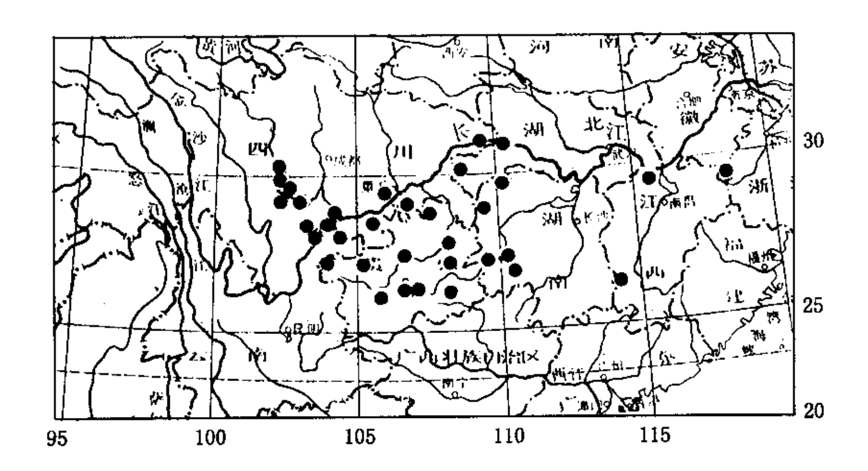


图 3　鳞果星蕨的地理分布

Fig. 3　The distribution of *Lepidomicrosorum buergerianum*

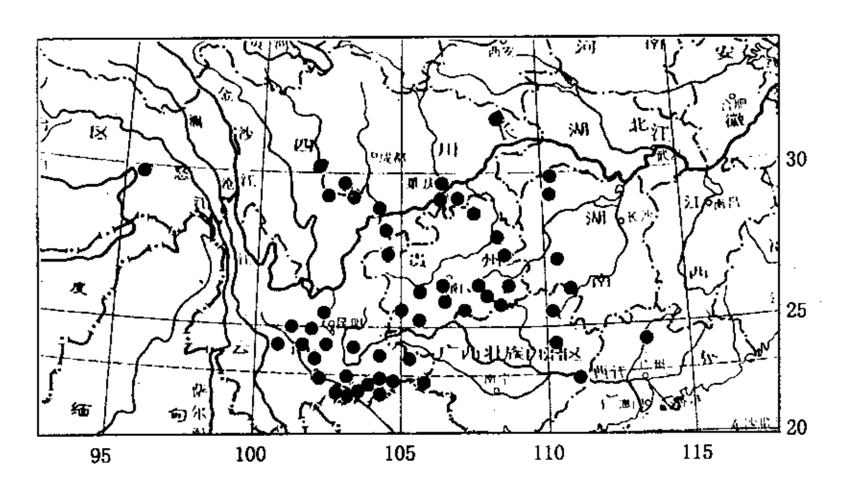


图 4　云南鳞果星蕨的地理分布

Fig. 4　The distribution of *Lepidomicrosorum hymenodes*

chartaceous, venation obscure; rhizome with circumvascular sheaths in the cortex only; spores small .... 1. **L. buergerianum**

1. Frond generally more than 20 cm long, with base cuneate or attenuate; texture herbaceous, venation distinct; rhizome with circumvascular sheaths only or with circumvascular sheaths and scatted strands of sclerenchyma in the cortex; spores large .... 2. **L. hymenodese**

5.1　鳞果星蕨　（江西植物志）　图 5

Lepidomicrosorum buergerianum (Miq.) Ching et Shing ex S. X. Xu in J. F. Cheng et G. F. Zhu, Fl. Jiangxi 1: 322. 1993, f. 332; S. F. Wu in W. T. Wang, Keys Vasc. Pl. Wuling Mts. 67. 1995; R. J. Johns, Ind. Fil. Suppl. 7: 52. 1997. ——*Polypodium buergerianum* Miq, Ann. Mus. Lugd. Bot. 3: 170. 1867; C. Chr., Ind. Fil. 514. 1906; Takeda, Not. Roy. Bot. Gard. Edinb. 8: 290. 1915. ——*Microsorum buergerianum* (Miq.) Ching, Bull. Fan Mem. Inst. Biol. 4: 302. 1933; Icon. Fil. Sin. 2: 85.

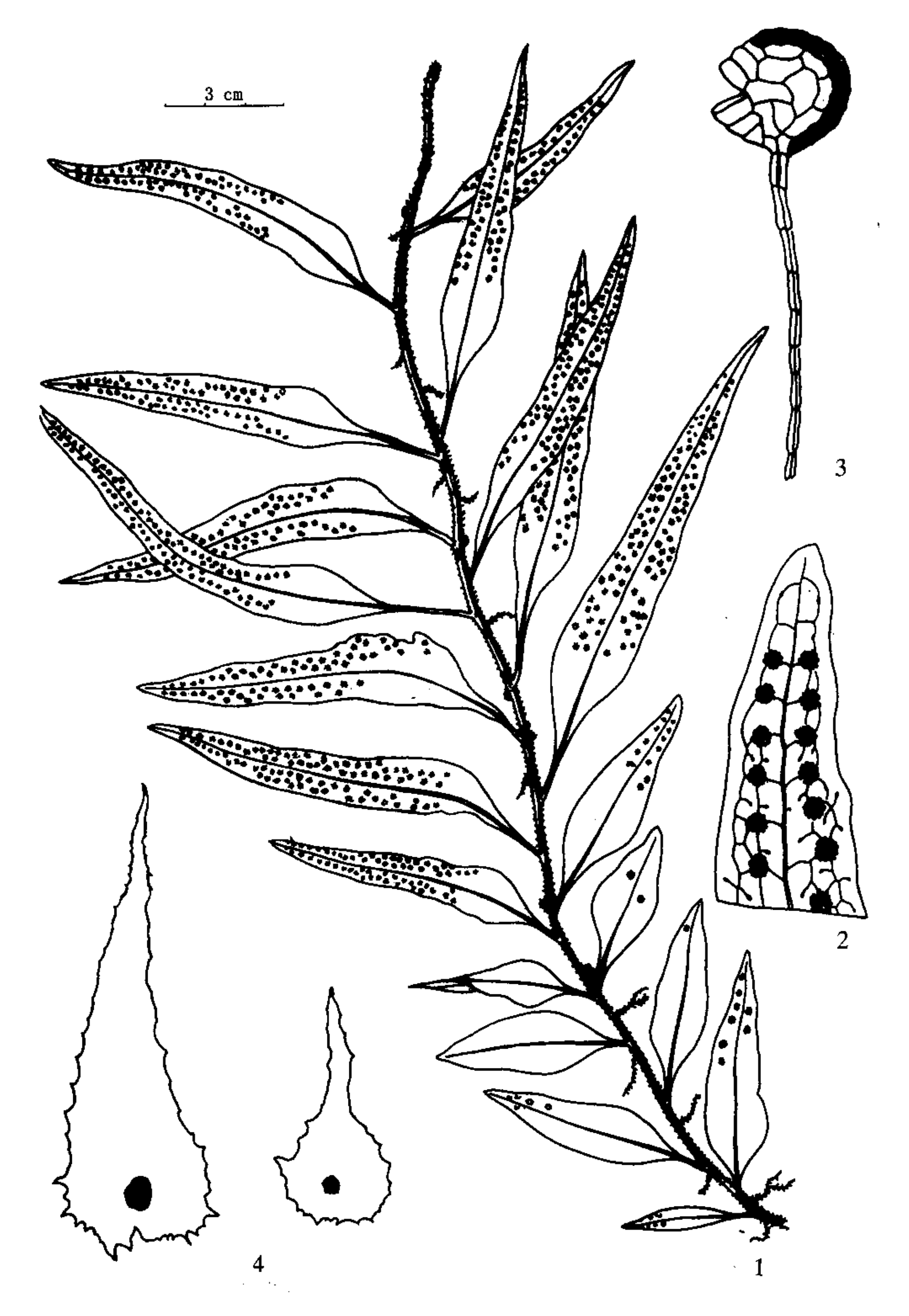


图 5 鳞果星蕨 1. 植株；2. 叶的一部分；3. 孢子囊；4. 根状茎上的鳞片。(冀朝桢绘)

Fig. 5 *Lepidomicrosorum buergerianum* (Miq.) Ching et Shing ex S. X. Xu 1. Plant; 2. Section of the foliage; 3. Sporangium; 4. Scales of the rhizome (C. Z. Ji).

1934, pl. 85; H. Ito, J. Jap. Bot. 11(2): 96. 1935; C. Chr. et Tardieu, Not. Syst. 8: 193. 1939; Tardieu et C. Chr. in Lecomte, Fl. Indo-Chine 7(2): 481. 1941, f. 56; Copel., Gen. Fil. 197. 1947; S.H. Fu, Ill. Import. Chin. Pl. Pterid. 227. 1957, f. 305; Ic. Corm. Sin. 1: 261. 1972, f. 522; De Vol et Kuo, Fl. Taiwan 1: 194. 1975, pl. 67; E.H. Walker, Fl. Okinawa South. Ryukyu Isl. 113. 1976; Edie, Ferns Hong Kong 126. 1978, f. 58; Tagawa, Coll. Ill. Jap. Pterid. 232. 1980; V.G. Tu, Novosti Sist. Vyssh. Rast. 13: 20. 1981; Fl. Fujian. 1: 247. 1982, f. 236; R.J. Chen, Fl. Anhui 1: 202. 1985, f. 213; Shieh *et al*. in Fl. Taiwan, 2nd. 1: 499. 1994, pl. 194; K. Iwats., Ferns & Fern All. Jap. 269. 1992, pl. 184-2. —— *Neocheiropteris buergerianus* (Miq.) Nakaike, New Fl. Jap. Pterid. (rev. & enlarg.) 684. f. 684a, b, 1992. TYPE: Japan. Buerger s.n., s.d., (holotype, L; photo, BM, PE).

Polypodium subhastatum Baker, J. Bot. 27: 177. 1889; Takeda, Notes Roy. Bot. Gard. Edinb. 8: 291. 1915; Ogata, Ic. Fil. Jap. 3: 144. 1930, pl. 144; K. Iwats., Ferns & Fern All. Jap. 268. 1992, pl. 183-5. ——*Microsorum subhastatum* (Baker) Ching, Bull. Fan Mem. Inst. Biol. 4: 298. 1933; H. Ito, J. Jap. Bot. 11 (2)97. 1935; B. Z. Ding *et al*. in Fl. Henan 1: 110. 1981, f. 135. ——*Neocheiropteris subhastata* (Baker) Tagawa, J. Jap. Bot. 27: 217. 1952.——*Lepidomicrosorum subhastatum* (Baker) Ching, Bot. Res. Contrb. Inst. Bot. Acad. Sin. 1: 12. 1983, pl. 2; R.J. Johns, Ind. Fil. Suppl. 6: 196. 1996. syn. nov. TYPE: China. Hubei, Henry 5450 (holotype, K; isotype, GH).

Polypodium hederaceum Christ, Bull. Acad. Int. Geogr. Bot. 11: 215. 1902. —— *Lepidomicrosorium hederaceum* (Christ) Ching, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 11. 1983, pl.1; S. F. Wu in W. T. Wang, Keys Vasc. Pl. Wuling Mts. 67. 1995; R. J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: China. Guiyang, Guizhou, Bodinier & Chaffanijion 2087 (lectotype, P, PE).

Polypodium superficiale var. *chinense* Rosenst., Feddes Repert. Spec. Nov. Regni Veg. 13: 134. 1914. syn. nov. TYPE: China. Ganchuen, Guizhou, Cavalerie s.n. (B, L, P, S, UC, US).

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TYPE: China. Suijiang, Yunnan, W. M. Zhu 4985 (PYU).

Lepidomicrosorium latibasis Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 6. 1983, pl. 3, f. 3; S.F. Wu in W.T. Wang, Keys Vasc. Pl. Wuling Mts. 67. 1995; R.J. Johns, Ind. Fil. Suppl. 6: 196. 1996. syn. nov. TYPE: China. Hefeng, Hubei, H & J. Li 6837 (PE).

Lepidomicrosorium asarifolium Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 11. pl. 5: 3, 1983; S.X. Xu, Fl. Jiangxi 1: 321. f. 331, 1993; S.F. Wu in W. T. Wang, Keys Vasc. Pl. Wuling Mts. 67. 1995; R. J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: China. Jiangxi, Mt. Jinggang, J. F. Chen 730107 (PE).

Lepidomicrosorium lanceolatum Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 8. 1983; R. J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: China. Guizhou, Anshun, P. S. Wang 75804 (PE).

Lepidomicrosorium brevipes Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 13. 1983; S. X. Xu in Fl. Jiangxi 1: 322. 1993; R. J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: China. Guizhou, Zhenyi, Sichuan-Guizhou Exped. 1528 (PE).

Lepidomicrosorium yiliangense Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 7. 1983, pl. 3: 4; R. J. Johns, Ind. Fil. Suppl. 6: 196. 1996. syn. nov. TYPE: China. NE Yunnan, NE Yunnan Exped. 692 (KUN).

Lepidomicrosorium emeicola Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 7. 1983; S. F. Wu in W. T. Wang, Keys Vasc. Pl. Wuling Mts. 67. 1995; R. J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: R. C. Ching s.n. (PE), Mt. Emei , Sichuan, China.

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Lepidomicrosorium angustifolium Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 8. pl. 4:2, 1983. syn. nov. TYPE: China. Sichuan, Mt. Emei, K. C. Kuan & W. T. Wang 2439 (PE).

Lepidomicrosorium sichuanense Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 8. pl. 4, f. 1, 1983; R. J. Johns, Ind. Fil. Suppl. 6: 196. 1996. syn. nov. TYPE: China. Sichuan, S.Y. Chang & Y.S. Ren 7596 (PE).

Lepidomicrosorium suijiangense Ching et W. M. Chu, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 13. pl. 5: 4, 1983; R. J. Johns, Ind. Fil. Suppl. 6: 196. 1996. syn. nov. TYPE: China. Yunnan, Suijiang, W. M. Chu 4791 (PE).

Microsorum simulans Ching et Z. Y. Liu, Bull. Bot. Res. 4: 26. pl. 57, 1984; R. J. Johns, Ind. Fil. Suppl. 6: 230. 1996. syn. nov. TYPE: China. Sichuan, Nanchuan, Mt. Jinfo, Z. Y. Liu 3951 (IMC).

China（中国）. **Guizhou**（贵州）：Anshun（安顺），P. S. Wang 75995（WPS）；Bijie（毕节），P. H. Yu 629（PE）；Chishui（赤水），F. Wang 78514（WPS）；Daozhen（道真），S. D. Li s.n.（WPS）；Guiding（贵定），Cavalerie 893（PE）；Guiyang（贵阳），Bodionier 2087（PE）；Shiqian（石阡），Y. Tsiang 4112（PE）；Leishan（雷山），P. S. Wang 77123（WPS）；Yinjiang（印江），H. Y. Hou 1004（PE）；Zunyi（遵义），Sichuan-Guizhou Exped. 1528（PE）. **Hubei**（湖北）：Badong（巴东），G. H. Yang 65612（PE）；Hefeng（鹤峰），H. J. Li 8395（PE）；Lichuan（利川），K. S. Fu & Z. S. Zhang 1947（PE）. **Hunan**（湖南）：Dongkou（洞口），L. H. Liu *et al*. 16611（PE）；Qianyang（黔阳），Z. T. Li 1696（IBSC，PE）；Yongshun（永顺），L. H. Liu 9611（IBSC，PE）；Zhijiang（芷江），Wuling Exped. 1558（IBSC）. **Jiangxi**（江西）：Mt. Jinggang（井岗山），J. Yue *et al*. 5079（PE）；Mt. Lushan（庐山），M. J. Wang 4019（PE）. **Chongqing**（重庆），X. C. Deng *et al*. 374（PE）. **Sichuan**（四川）：Baoxing（宝兴），S. Y. Chang & Y. S. Ren 7596（PE）；Daxiangling（大相岭），H. S. Kung 4103（PE）；Mt. Emei（峨眉山），K. H. Shing & K. Y. Lang 508(PE）；Fengjie（奉节），M. Y. Fang 24579（IBSC，PE）；Junlian（筠连），Chuanjingyi Exped. 132（PE）；Leibo（雷波），Z. T. Guan 7869(PE）；Nanchuan（南川），W. P. Fang 5804（PE）；Pingshan（屏山），Sichuan Economic Pl. Exped.（Yibin Distrct）896（PE）；Tianquan（天全），Sichuan Exped. 2320（PE）；Yaan（雅安），H. S. Kung 2261(PE）. **Taiwan**（台湾）：Pingdong（屏东），C. C. Liao 202（PE）. **Yunnan**（云南）：Suijiang（绥江），W. M. Chu 4986（PE）；Yiliang（彝良），N. E. Yunnan Exped. 692（KUN）；Yongshan（永善），N. E. Yunnan Exped. 423（PE）. **Zhejiang**（浙江）：Kaihua（开化），Lishui Forest School Exped. 30015（PE）.

Japan（日本）：Kuli，Y. Saiki 2331（PE）；Shikoku，H. Inoue 1202（PE）；Shizuoka，K. Satake s. n.（PE）；Ryukyus，S. Karata & T. Nakaike 1126（PE）.

越南也有分布。攀援于林中树干上或附生于岩石上。海拔 450～2000 m。

过去本种植物一直应用 *Polypodium subhastatum* 的名字，经研究比较 *P. buergerianum* 的模式照片，我们同意 Bosman（1991）和 Nakaike（1992）将 *P. subhastatum* 并入 *P. buergerianum* 的观点。

本种形态和大小变化很大(图 6)，孢子体的初期发育于林下的土壤中，长出细长的根状茎后，就从树干基部向上攀援，高可达 2～3 m，有时也附生于林荫石壁上，喜生于海拔 450～2000 m 空气潮湿而流动性不大的阴凉的山地次生林中。树干下部生长的叶片多呈常春藤形，叶的基部均比较宽，或呈阔心形；攀援于树干上部满布孢子的叶片多呈披针形，叶的基部截形。其中还有许多中间类型。有的叶基部有羽裂现象，可能是与叶基部羽裂物种杂交的结果。

Takei（1983）报道了产自日本的 *M. buergerianum* 的染色体数目 2n = 108 和 2n = 144；被认为是四倍体的 *Neocheiropteris subhastata* 的染色体数目 2n = 144。1992 年，Nakaike 也报道了 *M. buergerianum* 的染色体数目为 2n = 144。本种分布集中，叶形变化大，显然是一个复杂的类群，需要作进一步的研究。

5.2　云南鳞果星蕨（新拟）　图 7



图6 鳞果星蕨的叶片形态（×1/4）
Fig.6 The leaf morphology of *Lepidomicrosorum buergerianum* (×1/4)

Lepidomicrosorum hymenodes (Kunze) L. Shi et X. C. Zhang, comb. nov.

Polypodium hymenodes Kunze, Linnaea 23: 279. 1850; Mett., Fil. Hort. Lips. 37. 1856, t. 25, f. 40~41; Takeda, Notes Roy. Bot. Gard. Edinb. 8: 287. 1915; C. Chr., Ind. Fil. Suppl. 54. 1917; Acta Horti. Goteberg. 1: 101. 1924. ——*Polypodium hymenodes* var. *sparsiorum* Takeda, Notes Roy. Bot. Gard. Edinb. 8: 287. 1915. ——*Microsorum hymenodes* (Kunze) Ching, Bull. Fan Mem. Inst. Biol. 4: 301. 1933; Ic. Fil. Sin. 2: 84. pl. 84, 1934; H. Ito, J. Jap. Bot. 11(2): 96. 1935; C. Chr. et Tardieu, Not. Syst. 8: 194. 1939; Tardieu et C. Chr. In Lecomte, Fl. Indo-Chine 7(2): 481. 1941; Copel., Gen. Fil. 197. 1947; S.H. Fu, Ill. Import. Chin. Pl. Pterid. 227. 1957; Ic. Corm. Sin. 1: 261. 1972; V. G. Tu, Novosti Sist. Vyssh. Rast. 13: 20. 1981; Ching et S.K. Wu in Fl. Xizang. 1: 328. 1983; C.K. Satija et S.S. Bir, Polyp. Ferns India 74. 1985; S. X. Xu in Fl. Jiangxi 1: 340. 1993; S. F. Wu in W. T. Wang, Keys Vasc. Pl. Wuling Mts. 72. 1995. TYPE: China. Yunnan, Mengzi, Henry 9265B (lectotype).

Polypodium subhemionitideum Christ, Bull. Herb. Boissier 7: 5. 1899. ——*Leptochilus subhemionitideus* (Christ) Bosman, Monogr. Microsorum, Leidon Bot. Ser. 14: 117. f. 27, 1991. syn. nov. TYPE: China. Yunnan, Mengzi, Henry 9265B (P, isotype B, K, PE).

Polypodium superficiale var. *attenuatum* Rosenst., Feddes Repert. Spec. Nov. Reg-



图 7　云南鳞果星蕨　1. 植株；2. 根状茎上的鳞片。
Fig. 7　*Lepidomicrosorum hymenodes* (Kunze) L. Shi et X. C. Zhang
1. Plant; 2. Scales of the rhizome (from Ic. Fil. Sin. 2: 84. 1934, pl. 84)

ni Veg. 13: 134. 1914. syn. nov. TYPE: China. Guizhou, Ganchuen, Cavalerie 4009 (BM, K, P).

Polypodium hymenodes var. *marginale* Takeda, Notes Roy. Bot. Gard. Edinb. 8 : 288. 1915. ——*Microsorum hymenodes* var. *marginale* Ching, Bull. Fan Mem. Inst. Biol. 4: 301. 1933. TYPE: China. Yunnan, Mengzi, Henry 9265A (lectotype K, isotype P, PE).

Microsorum rubripes Ching et W. M. Chu, Bull. Bot. Res. 3: 11. 1983, pl. 10; S. F. Wu in W. T. Wang, Keys Vasc. Pl. Wuling Mts. 72. 1995; R. J. Johns, Ind. Fil. Suppl. 6: 230. 1996. syn. nov. TYPE: China. Sichuan, Nanchuan, Mt. Jinfoshan, Z. Y. Liu & C.L. Li 1171 (IMC).

Lepidomicrosorium hunanense Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 6. pl. 3: 1, 1983; R. J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: China. Hunan, Xinning, L. H. Liu 15053 (PE).

Lepidomicrosorium emeiense Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 10. 1983; R. J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: China. Sichuan, Mt. Emei, K. H. Shing & K. Y. Lang 1005 (PE).

Lepidomicrosorium crenatum Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 11. 1983; R.J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: China. Sichuan, Mt. Emei, R. C. Ching 88 (PE).

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Lepidomicrosorium hongchunpingense var. *laceratum* Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 9. 1983; R. J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: China. Sichuan, Mt. Emei, K. H. Shing & K. Y. Lang 1084 (PE).

Microsorum jinfoshanense Ching et Z. Y. Liu, Bull. Bot. Res. 3: 12. 1983; S. F. Wu in W.T. Wang, Keys Vasc. Pl. Wuling Mts. 72. 1995; R. J. Johns, Ind. Fil. Suppl. 6: 229. 1996. ——*Lepidomicrosorium nanchuanense* Ching et Z. Y. Liu, Bull. Bot. Res. 4: 27. 1984; R. J. Johns, Ind. Fil. Suppl. 6: 196. 1996. syn. nov. TYPE: China. Sichuan, Nanchuan, Mt. Jinfo, Z. Y. Liu 3551 (IMC, PE).

Lepidomicrosorium lineare Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 5. 1983; R. J. Johns, Ind. Fil. Suppl. 6: 196. 1996. syn. nov. TYPE: China. Guangxi, Longsheng, P. S. Chiu 4824 (PE).

Lepidomicrosorium undulatum Ching et Chiu ex Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 11. 1983; R. J. Johns, Ind. Fil. Suppl. 6: 196. 1996. syn. nov. TYPE: China. Guangxi, Longsheng, P. S. Chiu 4647 (PE).

Lepidomicrosorium longshengense Ching et Shing, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 9. 1983; S. F. Wu in W. T. Wang, Keys Vasc. Pl. Wuling Mts. 67. 1995; R.J. Johns, Ind. Fil. Suppl. 6: 196. 1996. syn. nov. TYPE: China. Guangxi, Longsheng, F. N. Wei 284 (PE).

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Lepidomicrosorium caudifrons Ching et W. M. Chu, Bot. Res. Contrb. Inst. Bot. Inst. Acad. Sin. 1: 10. 1983; R. J. Johns, Ind. Fil. Suppl. 6: 195. 1996. syn. nov. TYPE: China. Yunnan, Suijiang, W. M. Chu 4973 (PE).

China (中国). **Guangdong** (广东): Ruyuan (乳源), L. Teng 5648 (PE). **Guangxi** (广西): Cangwu (苍梧), H. S. Chun 10359 (PE); Mt. Damiaoshan (大苗山), H. S. Chun 17048 (PE); Mt. Jiuwandashan (九万大山), H. S. Chun 14670 (PE); Lingle (凌乐), C. K. Li 1908 (GXMI, PE); Longsheng (龙胜), P. H. Chiu 4824 (PE); Napo (那坡), S. China Exped. 947 (IBSC); Yaoshan (瑶山), K. K. Whong Y. S. 176 (PE). **Guizhou** (贵州): Anshun (安顺), P. S. Wang 75022 (WPS); Chishui (赤水), F. Wang 78513 (WPS); Daozhen (道真), S. Z. Fang 1585 (WPS); Dushan (独山), H. Y. Hou 1878 (PE); Huishui (惠水), F. Wang 299 (WPS); Jiangkou (江口), C. P. Tsien *et al*. 32570 (PE); Kaili (凯里), S. Guizhou Exped. 3909(PE); Leishan (雷山), P. S. Wang 76878 (WPS); Puan (普安), D. Y. Tan 989 (WPS); Qingzhen (清镇), Sichuan-Guizhou Exped. 1650 (PE); Rongjiang (榕江), S. Guizhou Exped. 2864 (PE); Yinjiang (印江), C. S. Chang *et al*. 401767 (PE); Zhenfeng (贞丰), Y. Tsiang 4324 (PE). **Hubei** (湖北): Hefeng (鹤峰), H. J. Li 8600 (PE). **Hunan** (湖南): Qianyang (黔阳), Anjiang Agri. Sch. Exped. s.n. (PE); Sangzhi (桑植), L. H. Liu 9307 (PE); Wugang (武岗), L. H. Liu *et al*. 16047 (PE); Xinning (新宁), L. H. Liu 15042 (PE). **Chongqing** (重庆): B. Y. Zhang *et al*. 81-1183 (PYU). **Sichuan** (四川): Baxian (巴县), T. T. Yu 4234 (PE); Chengkou (城口), T. L. Dai 103163 (PE); Daxiangling (大相岭), H. S. Kung 4115 (PE); Mt. Emei (峨眉山), K. H. Shing & K. Y. Lang 549 (PE); Hanyuan (汉源), T. P. Wang 8855 (PE); Hongya (洪雅), W. P. Fang 8494 (PE); Nanchuan (南川), Z. Y. Liu 4004 (PE); Junlian (筠连), Chuanjingyi Exped. 132 (PE); Pingshan (屏山), Chuanjingyi Exped. 896 (PE); Tianquan (天全), K. C. Kuan & W. T. Wang 2343 (PE). **Xizang** (西藏): Bomi (波密), J. W. Zhang & J. T. Zhang 426 (PE). **Yunnan** (云南): Chuxiong (楚雄), J. Peng *et al*. 19306 (PYU); Eshan (峨山), S. K. Wu 313 (PE); Guangnan (广南), W. M. Chu *et al*. 12899 (PYU); Jingdong (景东), Yunnan Univ. Biol. Dept. Exped. s. n. (PYU); Jinping (金平), Y. C. Hsu 482 (PE); Lufeng (禄丰), J. J. He 27156 (PYU); Luquan (禄劝), W. C. Cheng & C.T. Hwa 932 (PE); Maguan (马关), S.K. Wu 4180 (PE); Malipo (麻栗坡), W. M. Chu 21780 (PYU), K. M. Feng 12696 (PE), C. W. Wang 87003 (PE); Mengzi (蒙自), Henry 9265A, B (PE); Mile (弥勒), W. M. Chu *et al*. 23845 (PYU, WPS); Pingbian (屏边), K. M. Feng 4518 (PE); Qiubei (邱北), H. T. Tsai 51416 (PE); Shuangbai (双柏), W. M. Chu 3626 (PE, PYU); Wenshan (文山), K. M. Feng 11354 (PE); Xichou (西畴), W. M. Chu 8186 (PYU); Xinping (新平), W. M. Chu 382 (PYU); Yuanjiang (元江),

S. K. Wu 816 (PE); Yuanyang (元阳), W. M. Chu *et al*. 8499 (PYU); Zhenxiong (镇雄), P. H. Yu 1087 (PE).

Vietnam (越南): Sino-Vietnam Exped. 1174 (PE).

日本、尼泊尔和印度也有分布。攀援于林中树干上或附生于岩石上。海拔 700～2000 m。

基于秦仁昌(1933)的星蕨属植物无鳞片状隔丝的概念,将具鳞片状隔丝的鳞果星蕨属从星蕨属分出来。鳞果星蕨属植物同外形极似而无鳞片状隔丝的褐叶星蕨 *M. superficiale* 显然不同,同毛鳞蕨属植物不同在于后者根状茎上鳞片下面中央具有一簇深棕色粗毛。

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